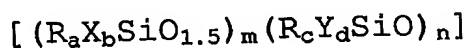


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What is claimed is:

1. A process for producing low-k dielectric films on semiconductors or electrical circuits, which comprises using  
 5 incompletely condensed polyhedral oligomeric silsesquioxanes of the formula



10 with:

a, b = 0-1; c, d = 1; m+n ≥ 3; a+b = 1; n, m ≥ 1,

R = hydrogen atom or alkyl, cycloalkyl, alkenyl, cycloalkenyl, alkynyl, cycloalkynyl, aryl or heteroaryl group, in each case substituted or unsubstituted,

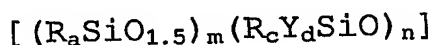
15 X = an oxy, hydroxyl, alkoxy, carboxyl, silyl, silyloxy, halogen, epoxy, ester, fluoroalkyl, isocyanate, acrylate, methacrylate, nitrile, amino or phosphine group or substituents of type R containing at least one such group of type X,

20 Y = hydroxyl, alkoxy or a substituent of type O-SiZ<sub>1</sub>Z<sub>2</sub>Z<sub>3</sub>, where Z<sub>1</sub>, Z<sub>2</sub> and Z<sub>3</sub> are fluoroalkyl, alkoxy, silyloxy, epoxy, ester, acrylate, methacrylate or a nitrile group or substituents of type R and are identical or different,

25 not only the substituents of type R being identical or different but also the substituents of type X and Y in each case being identical or different, and comprising at least one hydroxyl group as substituent of type Y, for producing the film.

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2. The process as claimed in claim 1, wherein incompletely condensed polyhedral oligomeric silsesquioxanes of the formula



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with:

a, c, d = 1; m+n ≥ 3; n, m ≥ 1,

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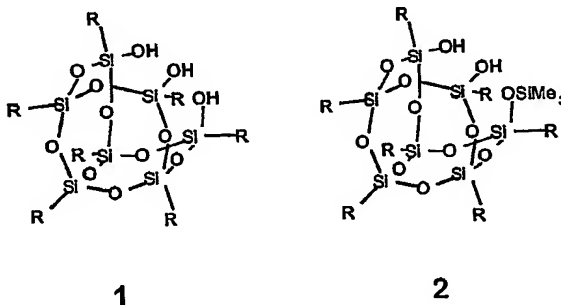
**R** = hydrogen atom or alkyl, cycloalkyl, alkenyl, cycloalkenyl, alkynyl, cycloalkynyl, aryl or heteroaryl group, in each case substituted or unsubstituted,

**Y** = hydroxyl, alkoxy or a substituent of type  
 5 O-SiZ<sub>1</sub>Z<sub>2</sub>Z<sub>3</sub>, where Z<sub>1</sub>, Z<sub>2</sub> and Z<sub>3</sub> are fluoroalkyl, alkoxy, silyloxy, epoxy, ester, acrylate, methacrylate or a nitrile group or substituents of type **R** and are identical or different,

not only the substituents of type **R** being identical or  
 10 different but also the substituents of type **Y** in each case being identical or different, and comprising at least one hydroxyl group as substituent of type **Y**, are used.

3. The process as claimed in claim 1 or 2, wherein  
 15 incompletely condensed polyhedral oligomeric silsesquioxanes containing not more than three hydroxyl groups as type **Y** substituent are used.

4. The process as claimed in at least one of claims 1 to 3,  
 20 wherein incompletely condensed polyhedral oligomeric silsesquioxanes of structure 1 or 2



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are used.

5. The process as claimed in at least one of claims 1 to 4,  
 30 wherein incompletely condensed polyhedral oligomeric silsesquioxanes are reacted with alkoxy silanes.

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6. The process as claimed in claim 5, wherein incompletely condensed polyhedral oligomeric silsesquioxanes are reacted with tetraalkoxysilanes.

5 7. The process as claimed in at least one of claims 1 to 6, wherein the molar ratio of the incompletely condensed polyhedral oligomeric silsesquioxanes to the coreactant capable of hydrolytic condensation is from 1:10 to 10:1.

10 8. The process as claimed in claim 7, wherein the molar ratio of the incompletely condensed polyhedral oligomeric silsesquioxanes to the coreactant capable of hydrolytic condensation is 2:1.

15 9. The process as claimed in at least one of claims 1 to 8, wherein the low-k dielectric film is produced by means of a wet-chemical coating method.

20 10. The process as claimed in claim 9, wherein the low-k dielectric film is produced by spin coating and subsequent calcining.

25 11. A low-k dielectric film produced as claimed in at least one of claims 1 to 10.

12. The low-k dielectric film as claimed in claim 11, which has a k value of less than or equal to 2.3, measured at a frequency of 880 kHz.